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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHU, KIM KWOK

ART UNIT	PAPER NUMBER
2653	4

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/783,008

Applicant(s)

GIBSON, GARY A.

Examiner

Kim-Kwok CHU

Art Unit

2653

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 6, 8-19 is/are rejected.
- 7) ☒ Claim(s) 4, 7 and 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 and 3. 6) ☐ Other: \_\_\_\_\_

***Specification***

1. The specification of the disclosure is objected to because of the following:

(a) on page 1, the application number of the related application is missing. Correction is required.

***Claim Objections***

2. Claims 12-14 and 17 are objected to because of the following informalities:

(a) in claim 12, the term "one-dimensional conductor molecules" is objected because a molecules is not one dimensional;

(b) similarly, in claims 13 and 17, the term "one-dimensional conductor molecules" is objected because a molecules is not one dimensional; and

(c) in claim 14, lines 1 and 2, the term "the conductive molecules comprise molecules" should be change to --the molecules comprises conductive molecules--.

Appropriate correction is required.

**Claim Rejections - 35 USC § 102**

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --  
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 8, 9, 10, 14, 15, 16, 18 and 19 are rejected under 35 U.S.C. § 102(e) as being anticipated by Manalis et al. (U.S. Patent 6,519,221).

Manalis teaches an optical disk having all of the elements and means as recited in claims 1, 2 and 8. For example, Manalis teaches the following:

- (a) as in claim 1, a data-storage device (Fig. 1);
- (b) as in claim 1, a storage medium S (Fig. 1);
- (c) as in claim 1, nanometer-scaled data storage areas in the storage medium (Fig. 1; column 1, lines 66 and 67; column 3, lines 38 and 39);
- (d) as in claim 1, an energy-emitting tip 115 positioned in close proximity to the storage medium (Fig. 1);

(e) as in claim 1, a fluid medium positioned between the energy-emitting tip 115 and the storage medium S (Fig. 1; column 2, lines 42 and 43);

(f) as in claim 1, particles contained in the fluid medium (Fig. 1; fluid is particles/molecules in a liquid form);

(g) as in claim 2, the energy-emitting tip emits electrons (Fig. 1; AFM where its tip emits electrons to oxidize the medium's surface); and

(h) as in claim 8, the particles form a bridge between the tip and the storage medium (Fig. 1; fluid is an interface between the tip and the medium).

5. Claims 9, 10, 14, 15, 16, 18 and 19 have limitations similar to those treated in the above rejection, and are met by the references as discussed above. Claim 14 however also recites the following limitation which are also taught in the prior art of Manalis:

(a) as in claim 14, the molecules comprise conductive molecules (the fluid layer is conductive so that indents can be formed and read electrically).

**Claim Rejections - 35 USC § 103**

6. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

7. Claims 3 and 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Manalis et al. (U.S. Patent 6,519,221) in view of Durig et al. (U.S. Patent 6,084,849).

Manalis teaches a data storage device very similar to that of the instant invention. However, Manalis does not teach the following:

(a) as in claims 3 and 11, the energy-emitting tip emits thermal energy.

Durig teaches a storage medium where an emitting tip emits heat energy (Figs 3A-3C; column 2, lines 25-42).

To cause a bump as a data bit on a storage medium by using an AFM, either an electrons emitting probe such as Manalis's or a heat emitting probe such as Durig's can be used. Hence, for providing energy to the tip of the AFM, it would have been obvious to one of ordinary skill in the art at the time of

invention to choose either electron energy or heat energy, because both electron and heat are commonly used to make an indent on the surface of the storage medium.

8. Claims 5, 6, 12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manalis et al. (U.S. Patent 6,519,221) in view of Cleveland et al. (U.S. Patent 5,925,818).

Manalis teaches a data storage device very similar to that of the instant invention. However, Manalis does not teach the following:

(a) as in claims 5 and 6, the fluid comprised a high dielectric fluid/material;

(b) as in claims 12 and 17. the fluid/molecules comprises conductor molecules.

Cleveland teaches an AFM where:

(a) a layer of dielectric fluid is used (column 14, lines 3-14; dielectric material contain conductive molecules because it is not an absolute insulating material); and

(b) dielectric fluid affects the capacitance of the detecting field (column 14, lines 5-14).

To improve the AFM's performance such as decrease the detection error, a non-conducting spacer may be located between Manalis's energy emitting tip and the storage medium. Hence, it would have been obvious to one of ordinary skill in the art to

use a high dielectric fluid such as Cleveland's, because the high dielectric fluid can prevent ionized air which causes phenomena such as the variation of the relative capacitance between the tip and the storage medium.

9. Claims 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Manalis et al. (U.S. Patent 6,519,221) in view of Cleveland et al. (U.S. Patent 5,925,818) and Schaffer et al. (U.S. Patent 6,391,217).

Manalis in view of Cleveland teaches a data storage device very similar to that of the instant invention. However, both Manalis and Cleveland does not teach the following:

(a) as in claim 13, the conductor molecules comprises polymers.

Schaffer teaches an AFM having a liquified dielectric layer 110 made of dielectric polymer (Fig. 4b; column 4, lines 37-48).

For a dielectric material act as a fluid, it would have been obvious to one of ordinary skill in the art to use Schaffer's dielectric polymer as Manalis's fluid, because the dielectric polymer can be liquefied.



***Allowable Subject Matter***

10. Claims 4, 7, and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is an Examiner's statement of reasons for the indication of allowable subject matter:

As in claims 4 and 20, the prior art of record fails to teach or fairly suggest that the fluid medium comprises a ferrofluid.

As in claim 7, the prior art of record fails to teach or fairly suggest that the particles comprise a magnetic material.

***Prior Art***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kasama et al. (6,376,827) is pertinent because Kasama teaches an optical probe.

Aratani (6,269,067) is pertinent because Aratani teaches an AFM.

Binning et al. (5,831,13) is pertinent because Binning teaches a scanning probe which is immersed in a fluid layer so that the sample under investigation is protected.

13. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks Washington, D.C.  
20231 Or faxed to:

(703) 872-9314 (for formal communications intended for  
entry. Or:

(703) 746-6909, (for informal or draft communications,  
please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park  
II, 2021 Crystal Drive, Arlington. VA., Sixth Floor  
(Receptionist).

Any inquiry of a general nature or relating to the status of  
this application should be directed to the Group receptionist  
whose telephone number is (703) 305-4700.

Any inquiry concerning this communication or earlier  
communications from the examiner should be directed to Kim CHU  
whose telephone number is (703) 305-3032 between 9:30 am to 6:00  
pm, Monday to Friday.

*Kim* 10/3/03

Kim-Kwok CHU  
Examiner AU2653  
October 3, 2003

(703) 305-3032

  
TAN DINH  
PRIMARY EXAMINER